

of air from one location to another. Still, and in addition, there is a further requirement to have air conditioning and heating facilities at one location while the requirements of use of such air conditioned or heated air are at a remote location. Once again, there is a need for oversized ducts for the transport of such large volumes of air. There is a need at the present for the creation of such large ductwork through the spiral forming processes associated with previously small diameter ducts. [0010] Typically, forming heads used for the creation of such circular pipe are relatively expensive. These forming heads are typically roll formed of steel or aluminum material. The forming heads must be sufficiently strong so as to withstand the forces associated with the formation of the spiral pipe. In certain circumstances, minor adjustments in the diameter of the spiral pipe are necessary after the forming head has been manufactured. If minor adjustments to the diameter of the circular pipe are required, then the previously manufactured forming head must be scrapped and a new forming head created. As such, a need has developed so as to be able to adjust the diameter of the forming head with minimal cost and inconvenience. Additionally, where the forming head is of a relatively large diameter, a need has developed so as to avoid deflections in the large diameter of the forming head.

Revise paragraph [0030] as follows:

[0030] Referring to FIGURE 1, there is shown the apparatus 10 of the present invention for forming and oversize ~~an oversize~~ circular pipe. The apparatus includes spiral pipe forming machine 12 along with the elliptically-shaped forming head 14. The elliptically-shaped forming head 14 has a bottom end 16 of sharpest curvature supported on the bed 18 of the forming machine 12. A frame structure 20 extends upwardly from the floor upon which the machine 12 rests. Frame structure 20 includes several rollers 22 that are positioned in various locations so as to ride against the exterior surface of the circular pipe produced by the apparatus 10. A cross bar 24 extends across the narrow diameter portion of the elliptically-shaped forming head 14 so as to maintain the structural integrity of the forming head. A beam 26 is secured to an external structure, or is secured to frame 20, if required. Struts 28 serve to connect the cross bar 24 to the beam 26 and to maintain the structural integrity of the ellipse formed by the elliptically-shaped forming head 14.

Revise paragraph [0032] as follows:

[0032] A roller housing 38 is mounted on the frame 30. The roller housing ~~16~~ 38 contains a plurality of rollers which bend the edges of the metal strip 40 in predetermined shapes for forming a lockseam, and which may form corrugation grooves and stiffening ribs in the metal strip ~~15~~ 40. An upper drive roller 42 and a lower drive roller 44 are rotatably mounted within the frame 30 adjacent to the roller housing 38. The upper drive roller 42 pulls the continuous metal strip ~~15~~ 40 into the frame 30 through the roller housing 38, and over the lower drive roller 44. The drive rollers then cooperate to push the metal strip 15 between the upper guide plate 46 and the lower guide plate 48 into the forming head 14.

Please revise paragraph [0033] as follows:

[0033] The forming head 14 curls the metal strip in a helical manner so that the outer pre-formed edges of the strip ~~15~~ 40 are adjacent to each other and mesh therewith. The helically-curved strip thus takes the shape of a spiral cylinder. The adjacent, mated edges of the strip are then compressed between a support roller and a clenching roller so as to form a proper lock seam. The metal strip ~~15~~ 40 is continuously pushed by the drive rollers 42 and 44 through the forming head 14, in spiral manner, so that the spiral pipe is continuously produced with a spiral lockseam.

Please revise paragraph [0035] as follows:

[0035] Importantly, in FIGURE 1, it can be seen that the frame 30 includes a frame portion 50 that is positioned adjacent to the periphery of the forming head 14. This frame portion 50 is essential for the proper positioning of the drive rollers 42 and ~~40~~ 44. The drive rollers 42 and 44 push the metal strip 40 between the upper guide plate 46 and the lower guide plate 48 and into the support arm 52. Support arm 52 pushes down on the support roller and holds it in place. As such, the metal strip 40 will start to follow a path along the interior surface 54 of the elliptically-shaped forming head 14. As a result, the elliptically-shaped forming head 14 will create an elliptically-shaped spiral pipe, rather than the circular-shaped pipe of the prior art.

Please revise paragraph [0036] as follows:

[0036] As can be seen, the location of the frame portion 50 would create a obstruction relative to the support arm 52 and the location of the elliptically-shaped forming head 14 if the elliptically-shaped forming head 14 were of a circular configuration. The frame 50 creates an inherent barrier to the expansion of duct diameters beyond forty-eight inches in diameter. If the forming head 14 were circular, then extensions would have to be formed outwardly of the machine 12 in an inconvenient and unreliable manner. So as to accommodate the location of the frame 50, the elliptically-shaped forming head 14 is positioned so that the sharp curvature of the forming head 14 is located at the support arm 52 and on the bed of the machine 12. As a result, the sides adjacent to the frame portion 50 can extend upwardly therefrom in generally spaced relationship and non-interfering relationship with frame portion 50. The support frame 20 will maintain the elliptically-shaped forming head 14 in its desired orientation above the machine 12. As a result of the structure of the present invention, it is now possible to form circular pipe having diameters of greater than forty-eight inches. In order to determine the proper ellipse for the elliptically-shaped forming head 14, it is first necessary to understand the desired diameter of the ultimate circular pipe. Once the desired diameter is determined, then it is necessary to know the spacing between the support arm ~~22~~ 20 and the frame portion 50. As a result, a properly shaped ellipse of the elliptically-shaped forming head 14 can be calculated. As an example, if the ultimate diameter of the circular pipe is 100 inches then the elliptically-shaped forming head 14 will have a narrow diameter of 85 inches and a wide diameter of 114 inches.

Please revise paragraph [0037] as follows:

[0037] FIGURE 2 is an isolated view showing the elliptically-shaped forming head 14 of the present invention. The forming head 14 is formed of a steel material having a proper ellipse for the purposes of installation on the machine 12. The bottom end 16 of the elliptically-shaped forming head 14 should be positioned under the support arm 52. As a result, a suitable slotted area 60 should be formed at the bottom 16 so as to allow the metal strip 40 to be introduced thereinto. The metal strip 40 is free to be driven along the inner interior surface 54 in a continuous and spiral manner. The exterior surface 62 can be supported by the frame structures described hereinbefore.

Please revise paragraph [0038] as follows:

[0038] After the machine 12 has driven the metal strip 40 through the interior of the elliptically-shaped forming head, a length of elliptically-shaped spiral pipe will be formed. However, it is important consideration of the present invention that the ultimate goal is to produce a section of circular pipe of constant diameter. As such, the elliptically-shaped spiral pipe will need to be converted into circular pipe. FIGURE 3 shows the manner in which this conversion can occur. As can be seen in FIGURE 3, a first section 70 of spiral pipe has been positioned in a desired location. This first section 70 is of a circular configuration. The second section 72 illustrates the spiral pipe as formed by the process 10 of the present invention. Spiral pipe 72 will initially be of elliptical form. However, within the concept of the present invention, it is easy to form the elliptically-shaped spiral pipe section 72 into a circular pipe section by simply securing the end 74 of section 72 to the end 76 of section 70. Since the pipe section 72 is elliptically shaped, it can be easily manipulated, maneuvered and adjusted so as to conform with the edge of the circular spiral pipe 70. After connecting the end 74 to the end 76 by various means, such as welding, tapping, adhesive, sealants, or other means, the second pipe section 70 72 will have its desired circular configuration. Within the concept of the present invention, although the ultimate result of the use of the elliptically-shaped forming head 14 is the creation of elliptically-shaped spiral pipe, the spiral pipe is of a configuration that can be easily manipulated for movement and configuration into a circular design of constant diameter. Fixtures and other supports can be employed so as to maintain the circular orientation of the elliptically-shaped section 72 during its installation onto the circular section 70.

Please revise paragraph [0039] as follows:

[0039] FIGURE 4 shows an alternative embodiment of the elliptically-shaped forming head 80 of the present invention. Forming head 80 has an elliptically-shaped configuration as in the previous embodiment of the forming head 14. However, a first break 82 is formed on one side of the forming head 80 and a second break 84 is formed on an opposite side of the forming head 80. These breaks 80 84 and 82 are cuts through the wall thickness of the forming head 80. The breaks 82 and 82 84 are particularly configured so that the forming head 80 can be manipulated for size adjustments and for producing spiral pipe of different diameters. In FIGURE 4, it can be seen that an insert element 86 has been positioned between the edges of the break 82. Similarly, another insert element 88 has been positioned between the edges 84. As a result, the wide diameter of the elliptically-shaped forming head 80 is greater by a function of the length of the insert elements 86 and 88. Generally, each of the insert elements 86 and 88 has a U-shaped configuration in which the inner surface 90 of

the insert element 86 is flush with the interior surface 92 of the forming head 80. Similarly, the inner surface 94 of the insert 88 is flush with the interior surface 92 of the forming head 80. As a result, there will be no interruption or obstruction of the travel of the metal strip during the formation of the elliptically-shaped spiral pipe. As will be described hereinafter, when the insert elements 86 and 88 are removed, the breaks 82 and 84 will be closed such that the interior surface 92 of forming head 80 is contiguous and flush with itself.

Please revise paragraph [0042] as follows:

[0042] In FIGURE 7, it can be seen how the insert element 86 has been removed. As a result, the break 82 is closed so that the edges 100 and 102 are in juxtaposition. The inside surface 92 of the forming head 80 will be continuous and flush. The first flange 104 is joined the second flange 108 through the use of bolts ~~+20~~ 122. Removal of the insert element 86 will cause the maximum diameter of the elliptically-shaped forming head 80 to be reduced in size. If it is necessary to make minor adjustments in the diameter in the forming head 80, then the insert elements 86 and 88 can be suitably employed. As a result, the present invention eliminates the need for constantly scrapping, reforming or otherwise taking other expensive measures for the remedying of diameter discrepancies in the elliptically-shaped spiral pipe.